



ANNOTATED VERSION OF MODIFIED
SPECIFICATION TO SHOW CHANGES MADE

The following is a marked up version of the amended specification wherein brackets denoted deletions and underlining denotes additions.

Page 3, lines 19-21

FIG. 11 is a display diagram of a PIN entry screen presented subsequently to the rental options screen in FIG. 10 indicating that the selected MOD title is blocked because of its rating and providing a personal identification (PIN) entry to access the blocked MOD title.

Page 7, lines 32-36 through page 8, lines 1-2

The applications that are stored in the DRAM 44 may be applications that are loaded when the DHCT 16 initializes or are applications that are downloaded to the DHCT 16 upon a user-initiated command using an input device such as the remote 40. In this non-limiting example, as shown in FIG. 2, DRAM 44 contains the following application clients: an e-mail application client 59, a digital music application client 61, a service guide application 63 and a [video-on-demand] media-on-demand application client (MOD) 65 (discussed in more detail below). It should be clear that these applications are not limiting and merely serve as examples for this present embodiment of the invention.

Page 11, lines 9-16

Another signaling scenario supported by the present invention is the VOD content server 22 in-progress scenario. FIG. 4F is a display diagram 110 depicting the MOD application [MOD application] server in progress request 111 message communicated from the VOD content server 22 to the DNCS 23. The DNCS 23 uses this message 111 as an audit mechanism to determine if it is in sync with the VOD content server 22. The MOD application server periodically sends this MOD application server session in progress message 111 to the DNCS 23. The message 111 contains a list of all active sessions for that MOD application server, and the DNCS 23 compares this list to its list of active sessions for that particular application server [23]. The DNCS 23 takes appropriate action if the lists do not match.

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The DNCS 23 periodically initiates a MOD application client session in progress request 114 as shown in scenario 113 in FIG. 4G. This message 114 is used to periodically inform the network 18 of the sessions that are active on a DHCT 16. The DNCS 23 uses this message as an audit mechanism to determine if it is in sync with the DHCT 16. The DHCT 16 periodically sends a client in session progress message (not shown). This message [114] contains a list of all active sessions for the DHCT 16. The DNCS 23 compares this list to a list of active sessions for that DHCT 16 and takes appropriate action if the lists do not match.

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The present invention permits the DHCT 16 to initiate a MOD session tear down scenario. FIG. 4H is a display diagram 118 depicting the procedure for tearing down a session using the client initiated session release scenario. A session that is active on that particular DHCT 16 may be torn down by the DHCT 16. To initiate this process, the DHCT 16 sends a MOD application client release request 119 to the DNCS 23. The DHCT 16 sends the client release request 119 after it has stopped using all resources for a session that it is attempting to tear down. The DNCS 23 receives the client release request [19] 119 and initiates a MOD server release indication 121 to the VOD content server 22. The VOD content server 22 responds with a server release response 123 to the DNCS 23 which is then passed DHCT 16 in the form of a MOD client release confirm message 124. The network 18 does not release the resources provided for the session until the MOD server release response 123 is received from the MOD application server 19.

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A MOD session tear down scenario may also be initiated by the DNCS 23. FIG. 4J is display diagram 140 of the DNCS 23 initiated session tear down scenario. In so doing, the DNCS 23 initiates a server release indication message 142 to the VOD content server 22 providing the MOD session. The DNCS 23 may also simultaneously release the client release indication message 144 to the DHCT 16 notifying the DHCT 16 of the tear down sequence. The VOD content server 22 that received the server release indication message 142 responds by a server release response message 146, and the DHCT 16 responds to the client release indication message 144 with a client release response message 148. The [resource is] resources attributed or assigned to the MOD session are not released until both the client release response message 148 and the server release response message 146 [is] are received by the DNCS 23.

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The VOD content server 22 provides an API by which the application servers can register interest in session setup and tear down events. [Events] Messages describing these events are sent to registered application servers and include the session ID and the user (application) data contained in the session setup request, such as the MAC address of the DHCT 16, the title ID, and the rental option in the case of the MOD application. In this way the MOD application server can be notified when a VOD session is established with the VOD content server [21] 22 by the MOD application client 65. Additionally, the MOD application server 19 may use the API to request that the VOD content server 22 tear down the session if the user of the DHCT 16 is not authorized for the MOD service for billing reasons. The DHCT 16, the VOD content server 22, and the DNCS 23 may each initiate a session status scenario to determine the status of both the network and the other components described above. FIG. 4K is a display diagram 150 of a client initiated session status scenario. This procedure is used by DHCT 16 to query the DNCS 23 for the sessions that the DNCS 23 is maintaining for that DHCT 16. This procedure is also used to obtain detailed information about a session so that the DHCT 16 may re-establish a session after a reboot. The DHCT 16 initiates a client status request message 152 to the DNCS 23 to determine the status of the network 18. The DNCS 23 responds with a client status confirm message 154 reporting the status to the DHCT 16.

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FIG. 4M is a display diagram of a network initiated client session status request 161 and a server session status request 165. This procedure is used by the DNCS 23 to query a DHCT 16 for the sessions that are currently active. This procedure is also used to obtain detailed information about a session so the DNCS 23 can determine if a session at the DNCS 23 is the same as the session maintained by the DHCT 16. In the client session status request scenario, the DNCS 23 initiates a client status indication message 162 to the DHCT 16 requesting status indication information. The DHCT 16 responds with a client status response message [163] 164 to the DNCS reporting on the status of the MOD session. Similarly, the DNCS 23, in the server session status request 165, initiates a server status indication message 166 to the VOD content server 22. The VOD content server 22 responds with the status information in the form of a server status response message 168 to the DNCS 23 reporting on its status.

Page 14, lines 15-27

FIG. 8A is a display diagram of the MOD title catalog screen 197 showing the available MOD titles for selection by the user. The MOD title catalog screen 197 includes a banner for the name of the title catalog screen 198 at the top portion of the screen 197. The title of the selectable browse by list 199 may be placed below the banner 198. The MOD title catalog [server] screen 197 may optionally include an index in label bar 200. The user can sort through the available MOD titles in an area shown as the current browse by list 201. The user may navigate the current browse-by title list 201 by manipulating remote 40 (FIG. 7) as instructed by the graphics shown in the navigation information area 203. The navigation information area 203 may typically include images of selection arrows and selection buttons for choosing the desired MOD title from the current browse-by list 201. As yet another non-limiting example, a third option includes a full-screen title description page providing detailed information about a highlighted or selected MOD title. A button bar 209 is included at the bottom of the MOD title catalog screen 197 for providing the user various options including renting the desired MOD title or even exiting the MOD application completely.

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FIG. 8C is a display diagram of the MOD title catalog screen 197 configured as option two as described above. In this non-limiting example, a [long] description of the MOD title highlighted 201a in the current browse-by list 201 is shown in right portion of 204c. In this non-limiting example, selectable buttons 207 may be included in the right portion 204c providing additional options to those shown in button bar 209.

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FIG. 8D is a display diagram of a title description screen 218 (option four) presented to the user upon request from the MOD title catalog screen [211] 197 in FIG. 8A. The title description screen 218 is a full screen view. In a center portion of the display 220, detailed descriptive information is presented. The user is presented a cancel option 221 which re-displays the MOD title catalog screen 197. If the title information is larger than that available on the screen, scrolling capability is provided via arrow input keys for the user to view the entire title information.

Page 19, lines 3-13

Upon addition of a new MOD catalog or title category to the BFS server 28, the new files are immediately broadcast across the network 18 [are] at intermittent intervals enabling the MOD application client 65 on each DHCT 16 to receive the updated information. To notify the MOD

application client 65 that new catalog files are available, the MOD application server 19 uses the DSM-CC 34 on the DNCS 23 to send a UDP pass-thru message to the MOD application client via the operating system of the DHCT 16. Each MOD application client, upon determining that a new catalog or an updated version is available, uses the BFS client 43 (FIG. 3) in the DHCT 16 to download the files and store them in the MOD application client 65 database (not shown). The updated version of the files are implemented the next time the user activates the MOD title catalog screen 197. Alternatively, the MOD application client may chose to wait until the user activates the MOD service to load the most recent version of the MOD catalog for display at that time.

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Similarly, the MOD application client 65 on the DHCT 16 may be configured by the user to display MOD title categories in the MOD title catalog screen 197 according to interests for the individual user, if so configured by the system operator. As a non-limiting example, users with interests in sports programming may configure the DHCT 16 to display categories pertaining to sports programming in the MOD title catalog screen 197 as opposed to a regular configuration. When configured via the MOD application server GUI to operate in this mode, a single catalog [containing] contains all categories. Thus, the BFS client 43 at headend 11 would continuously broadcast all MOD title catalogs, but the DHCT 16 of the user with interest in sports programming would display the MOD title catalogs and MOD title categories pertaining to sports programming. The DHCT 16 may still download all MOD title categories so the user may still view MOD titles under those categories also, but separate action would be taken to display those categories. The list of categories desired for each individual user can be stored in non-volatile memory (NVM) (not shown) on the DHCT 16 if available. Preferably, the list of categories is transmitted over a UDP/IP socket to the MOD application server 19 by the MOD application client 65 using facilities of the digital television network 18. The MOD application client 65 then requests user information once after it is first initialized, as described previously. A settings graphical user interface offered by the MOD application client 65, if enabled by the system operator in the MOD service parameters, can be accessed by the user to set the list of categories that they desire be displayed. In navigating the MOD title catalog screen 197 to select a MOD title to purchase, the user may opt to preview a MOD title contained in the MOD title catalog screen 197. A preview of a MOD title enables the user to view a portion of the MOD title video stream substantially less than the entire title length. The preview may not necessarily start at the beginning of the MOD title, but rather may be any segment or segments of the MOD title. The portion of video contained in the preview may be configured by the system operator at the headend 11 through an interface (FIG. 22). The interface enables the system operator

to set the length and starting point of the preview. The preview is displayed by the MOD application client 65 setting up a session with the VOD content server 22 for the specified title ID starting at the specified Normal Play Time (NPT) location. VOD stream control mechanisms (*i.e.*, fast-forward, rewind, pause) are typically disabled during the preview. Once the user has viewed the entire preview, the user chooses whether to rent the MOD title just previewed. If not, then the DHCT 16 returns to the MOD title catalog screen for further navigation or exit.

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Returning to FIG. 5, once the user navigates through the MOD title catalog screen 197 and chooses a MOD title for purchase, DHCT 16 presents the user a title purchase option, as shown in step 213. FIG. 10 is a display diagram of a rental option screen 227 as one embodiment of the title purchase option described in step 213 (FIG. 5). Descriptive information about the selected MOD title is shown to the user in a center portion of the display 228. Contained in this descriptive information [228] is one or more "rental options": including both the rental period and rental price for the selected MOD title. In one rental option, the rental period may be the MOD title length—thereby requiring the user to immediately rent the MOD title and view it in its entirety at the time of rental. In another rental option, the rental period in the descriptive portion of the display 228 may be some integer multiplier of the MOD title length. As a non-limiting example, the rental period, as configured by the system operator at the headend 11 may be set to 2 times the MOD title length, so a two hour movie would enable a rental period of four hours. As yet another rental option, the rental period may be set to a specific period of time, such as a period of hours, days, or weeks. The price of the rental is included in the descriptive portion of the display 228 and may vary according to the popularity of the MOD title, the length of rental, and other variables as discussed in more detail below. Finally, if the user desires to rent the selected MOD title shown in the rental option screen 227 (FIG. 10), the user may depress a button on the remote 40 (FIG. 7) as directed in the rental option button bar 229. A cancel option may similarly be presented in the rental option button bar 229 that returns the user to the MOD title catalog screen 197. If more than one rental option is provided for the title, the rental option screen 227 includes a scrolling list of rental options.

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As still yet another rental option, the user may have the option to change the language setting of the purchased MOD title to one of any other available languages from the default setting. The MPEG data stream of the MOD title as delivered to the DHCT 16 may include two or more language audio tracks such that the DHCT 16 may be configured to play an alternately chosen

language according to the preference of the user. As a non-limiting example, a French speaking user may configure the DHCT 16, by an interface (not shown) presented by the MOD application client 65, to present the purchased MOD title in French language audio as opposed to, for example, [and] an English language default setting. Additionally, the DHCT 16 may, upon the user initially configuring the language, set the default for future presentations to the newly selected language. Alternatively, the MOD application client may access the language settings of the navigator 51 (FIG. 3) and present all purchased MOD titles according to that language setting—provided the chosen language is one included in the MPEG audio track of the MOD title.

Page 22, lines 14-35

Once the user purchases a particular MOD title from the rental options screen 227 (FIG. 10) but prior to presentation of the title, the MOD application client 65 determines if the title is blocked by its particular rating, as shown in step 230 ([FIG. 230] FIG. 5). To determine if a particular MOD title is blocked because of its rating, the user should have previously entered a setting in the DHCT 16 defining what types of ratings would be acceptable for viewing. In the preferred embodiment this information is maintained by the resident navigator application and made available to other application clients via an application programming interface (API). The MOD application client 65 accesses the pre-configured rating parameters for comparison to the rating information contained in the catalog for the subject MOD title being purchased. As a non-limiting example, if a user configured the DHCT 16 to prevent any movie with an “R” rating from being viewed or purchased, the MOD application client 65 would not allow any movie with such rating to be purchased or viewed unless specifically overridden by the user. In this non-limiting example, parents may choose to block MOD titles with “R” ratings to prevent children from accessing the MOD titles while allowing the parents to access the blocked titles upon entry of a proper PIN. Thus, if the MOD application client 65 determines in step 230 that the selected MOD title is blocked by its rating, the application client 65 allows the user to unblock the title on a proper PIN entry, as shown in step 231. In the preferred embodiment, the MOD application client 65 uses the “blocking PIN” number stored in the settings with the navigator 51 application. As such, a user can configure a single parental control PIN that is shared among applications. The user is allowed to escape or cancel from the PIN entry screen for overriding the title blocking according to rating, as shown in step 232. If the user chooses to escape the PIN entry screen or enters an improper or incorrect PIN, as shown in step 233, the MOD application client 65 returns the user to the MOD title catalog screen 197 where the user reinitiates the MOD purchase sequence described above.

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When the end of the MOD title is reached or the time allotted for viewing the MOD title has expired, the DHCT 16 presents the user with a message denoting that the rental period is over or that the MOD title has ended, as in step 260. FIG. 15 is a display diagram of the rental period end screen 260 presented to the user when the duration of the rental period has expired. Upon entering the cancel command through remote 40 (FIG. 7) as instructed by the rental period end screen 260, the user returns to the MOD title catalog screen 197 (FIG. 5).

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In another embodiment, the screen saver is presented as a video stream that, as a non-limiting example, is a set of movie trailers of movies currently available for rental in the MOD title catalog screen [227 (FIG. 10)] 197 (Fig. 8B). In this non-limiting example, the DHCT 16 tunes the MPEG stream containing the trailers, with the frequency and program number being passed to the MOD application client 65 in the service parameter data. Thus, in this non-limiting example, if the user has stopped the presentation of the MOD title and walked away, the DHCT 16, after a pre-configured amount of time, tunes the display 31 to a channel of movie trailers. The movie trailers, as described above, are pre-edited segments of MOD titles (movies, etc.) that are, for example, new releases or coming attractions and are continuously presented until the user presses a key on remote 40 (FIG. 7). Upon hitting any remote 40 key, the user is returned to the previous point where the user left off in the MOD application—the MOD current rental screen (which appears when the user stops the presentation of a MOD title).

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The system operator may configure, using the MOD application server GUI, parameters that determine when a session ends if the user interrupts the presentation of a MOD title. In one embodiment, the system operator may, via an interface (not shown), configure a session to be maintained for the entire rental duration even during the portion of the rental period when the user is not viewing the MOD title. This non-limiting example maintains the bandwidth for the user regardless of other system constraints or requests. In another embodiment, the system operator, through the interface at the headend 11, may configure the session providing the MOD title to be torn down after a pre-configured time. The pre-configured time may be based upon certain user input or some user inactivity. As a non-limiting example, if the user stops the presentation of a MOD title and the pre-configured time of inactivity expires, the session established to deliver the MOD title to the DHCT 16 of the user may be torn down as described above. When the user returns to the MOD

channel the MOD application client 65 determines that there is a current rental but that no session exists. It then follows the steps described previously to set up a session with the VOD content server 22. If this session fails and the rental period is still active, the MOD application client 65 [retrys] retries the session setup [and] at different intervals based on the reason for the session setup failure. Additionally, a problem barker is displayed informing the user that the MOD service cannot be re-established and that the MOD application is retrying.